

06.12.99

## Sertifikaat

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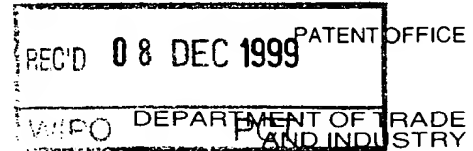
REPUBLIEK VAN SUID-AFRIKA

## Certificate

PATENTKANTOOR



REPUBLIC OF SOUTH AFRICA

DEPARTEMENT VAN HANDEL  
EN NYWERHEIDHiermee word gesertifiseer dat  
This is to certify that

the documents annexed hereto are true copies of:

Application form P.1, provisional specification and drawings of South African Patent Application No. 98/9282 as originally filed in the Republic of South Africa on 12 October 1998 in the name of ANGLO AMERICAN INDUSTRIAL CORPORATION LIMITED for an invention entitled: "A WINDSCREEN WIPER";

AND it is further certified that Patent Application No. 98/9282 and the invention forming the subject matter of the patent application, together with all priority rights flowing from the patent application under the provisions of the International Convention were duly assigned in accordance with law from ANGLO AMERICAN INDUSTRIAL CORPORATION LIMITED to TRICO PRODUCTS CORPORATION by virtue of Deed of Assignment effective from 14 November 1998 which Deed of Assignment was duly registered at the Patent Office, Pretoria, on 19 May 1999.

Gedeepte in  
Signe in PRETORIAin die Republiek van Suid-Afrika, hierdie  
in the Republic of South Africa, this27<sup>th</sup> dag van  
day of

October 1999

## PRIORITY

## DOCUMENT

SUBMITTED OR TRANSMITTED IN  
COMPLIANCE WITH RULE 17.1(a) OR (b)  
Registrateur van Patente  
Registrar of Patents

REPUBLIC OF SOUTH AFRICA  
PATENTS ACT, 1978  
APPLICATION FOR A PATENT AND  
ACKNOWLEDGEMENT OF RECEIPT  
(Section 30(1) Regulation 22)

REPUBLIC OF SOUTH AFRICA  
FORM P.1 **REVENUE**  
(to be lodged in duplicate)

121038

**R 060.00**

THE GRANT OF A PATENT IS HEREBY REQUESTED BY THE UNDERMENTIONED APPLICANT  
ON THE BASIS OF THE PRESENT APPLICATION FILED IN DUPLICATE

**INKOMSTE**

REPUBLIC OF SOUTH AFRICA

**HASR**

370

A & A REF: V13057 AL

PATENT APPLICATION NO.	
21	01 989282
71	FULL NAMES(S) OF APPLICANT(S)

~~ANGLO-AMERICAN INDUSTRIAL CORPORATION LIMITED~~  
*TRICO PRODUCTS CORPORATION* ~~APPLICANTS SUBSTITUTED~~  
19/5/99

ADDRESS(ES) OF APPLICANT(S)

44 Main Street, Johannesburg,  
Gauteng, Republic of South Africa.

54 TITLE OF INVENTION

"A WINDSCREEN WIPER"

- ☐ Only the items marked with an "X" in the blocks below are applicable.  
☐ THE APPLICANT CLAIMS PRIORITY AS SET OUT ON THE ACCOMPANYING FORM P.2. The earliest priority claimed is Country: No: Date:  
☐ THE APPLICATION IS FOR A PATENT OF ADDITION TO PATENT APPLICATION NO. |21|01|  
☐ THIS APPLICATION IS A FRESH APPLICATION IN TERMS OF SECTION 37 AND BASED ON APPLICATION NO. |21|01|

THIS APPLICATION IS ACCOMPANIED BY:

- ☒ A single copy of a provisional specification of 9 pages.  
☒ Drawings of 5 sheets.  
☐ Publication particulars and abstract (Form P.8 in duplicate) (for complete only).  
☐ A copy of Figure of the drawings (if any) for the abstract (for complete only).  
☐ An assignment of invention. (TO FOLLOW)  
☐ Certified priority document(s) (State quantity): .....  
☐ Translation of the priority document(s).  
☐ An assignment of priority rights.  
☐ A copy of Form P.2 and the specification of RSA Patent Application No. |21|01|  
☒ A Form P.2 in duplicate.  
☐ A declaration and power of attorney on Form P.3. (TO FOLLOW)  
☐ Request for ante-dating on Form P.4.  
☐ Request for classification on Form P.9.  
☐ Request for delay of acceptance on Form P.4.  
☒ A copy of Form P.1

74 ADDRESS FOR SERVICE: Adams & Adams, Pretoria

DATED THIS 12TH DAY OF OCTOBER

1998

A LEWIS

ADAMS & ADAMS  
APPLICANTS PATENT ATTORNEYS

The duplicate will be returned to the applicant's  
address for service as proof of lodging but is  
not valid unless endorsed with official stamp.

REGISTRAR OF PATENTS TRADE MARKS
RECEIVED
OFFICIAL DATE STAMP 1998-10-12
REGISTRAR REGISTRATEUR VAN PATENTE MOEDL. HANDELSMERKE EN OUTEURSREG

ADAMS & ADAMS  
PRETORIA

REPUBLIC OF SOUTH AFRICA  
PATENTS ACT, 1978

REPUBLIC OF SOUTH AFRICA  
REVENUE

FORM P.3

DECLARATION AND POWER OF ATTORNEY

(Section 30 - Regulation 8, 22(i)(c) and 33)

PATENT APPLICATION NO	
21	01

A&A Ref:

V13057 AL

LODGING DATE
22 October 1998

FULL NAME(S) OF APPLICANT(S)	
71	ANGLO AMERICAN INDUSTRIAL CORPORATION LIMITED

FULL NAME(S) OF INVENTOR(S)	
72	ADRIAAN RETIEF SWANEPOEL JOHANNES HENDRIK FEHRSEN

EARLIEST PRIORITY CLAIMED	COUNTRY	NUMBER	DATE
	33	NIL	31
		NIL	32
			NIL

NOTE: The country must be indicated by its International Abbreviation - see schedule 4 of the Regulations

TITLE OF INVENTION	
54	"A WINDSCREEN WIPER"

I/We **Michael John Nayler and Stuart Colin McNaughton**

hereby declare that :-

1. ~~I/we am/are the applicant(s) mentioned above;~~
2. I/we have been authorized by the applicant(s) to make this declaration and have knowledge of the facts herein stated in the capacity of **Director & Companies Secretary** of the applicant(s);
3. the inventor(s) of the abovementioned invention is/are the person(s) named above and the applicant(s) has/have acquired the right to apply by virtue of an assignment from the inventor(s);
4. to the best of my/our knowledge and belief, if a patent is granted on the application, there will be no lawful ground for the revocation of the patent;
5. ~~this is a convention application and the earliest application from which priority is claimed as set out above is the first application in a convention country in respect of the invention claimed in any of the claims; and~~
6. the partners and qualified staff of the firm of ADAMS & ADAMS, patent attorneys, are authorised, jointly and severally, with powers of substitution and revocation, to represent the applicant(s) in this application and to be the address for service of the applicant(s) while the application is pending and after a patent has been granted on the application.  
With effect from 12 October 1998.

SIGNED THIS **2<sup>ND</sup>** DAY OF **NOVEMBER**

1998

ANGLO AMERICAN CORPORATION  
OF SOUTH AFRICA LIMITED

Company Name: **ANGLO AMERICAN INDUSTRIAL CORP.**  
Full Names: **MICHAEL JOHN NAYLER / STUART COLIN MCNAUGHTON**  
Capacity:

(no legalization necessary)

In the case of application in the name of a company, partnership or firm, give full names of signatory/signatories, delete paragraph 1, and enter capacity of each signatory in paragraph 2.

If the applicant is a natural person, delete paragraph 2.

If the right to apply is not by virtue of an assignment from the inventor(s), delete "an assignment from the inventor(s)" and give details of acquisition of right.

For non-convention applications, delete paragraph 5.

REPUBLIC OF SOUTH AFRICA  
Patents Act, 1978**PROVISIONAL SPECIFICATION**

(Section 30 (1) - Regulation 27)

OFFICIAL APPLICATION NO.

21 01

989282

LODGING DATE

22 12 October 1998

FULL NAMES (S) OF APPLICANT(S)

71

~~ANGLO-AMERICAN INDUSTRIAL CORPORATION LIMITED~~

TEICO PRODUCTS CORPORATION

AANSOEKERS VERVANG  
APPLICANTS SUBSTITUTED  
19/8/99

FULL NAME (S) OF INVENTOR(S)

72

ADRIAAN RETIEF SWANEPOEL  
JOHANNES HENDRIK FEHRSEN

TITLE OF INVENTION

54

"A WINDSCREEN WIPER"

This invention relates to a windscreen wiper. More particularly, the invention relates to a windscreen wiper assembly and to a coupler for a windscreen wiper assembly.

5 According to a first aspect of the invention, there is provided a windscreen wiper assembly which includes

a wiper arm;

a windscreen wiper having a resiliently flexible elongate beam which is curved in a plane; and

10 a coupler for coupling an end of the wiper arm to the wiper in such a manner that resilient bending movement of the beam in the plane of curvature along its full length is substantially allowed.

The coupler may be mounted to the wiper such that longitudinal  
15 movement of the beam relative to a point on the coupler, rotation of the beam about its longitudinal axis and rotation of the longitudinal axis of the beam relative to longitudinal axis of the arm is substantially inhibited.

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According to a second aspect of the invention, there is provided a  
20 windscreen wiper assembly which includes

a wiper arm;

a windscreen wiper having a resiliently flexible elongate beam which is curved in a plane; and

5 a coupler for coupling an end of the wiper arm to the wiper, the coupler comprising a support structure with at least one fulcrum formation being defined by the support structure and a mounting means carried on the support structure for mounting the coupler to the beam at two spaced apart points so that the, or each, fulcrum formation abuts an upper surface of the beam and bending movement of the beam about the, or each, fulcrum formation in the plane of curvature is allowed.

10 The support structure may have an elongate, substantially planar base, with a pair of spaced apart fulcrum formations being defined on a bottom surface of the base. Each fulcrum formation may be in the form of an elongate protrusion located transversely to the base and in use, transversely to the plane of curvature. Each protrusion may have rounded or sharpened edges to allow movement of the beam about it.

15 The mounting means may be in the form of two pairs of spaced apart claws which extend from the base of the support structure. Each of the fulcrum formations may be located proximate or be aligned with one of the pairs of claws.

20 ~~The beam may be provided with a securing formation which is~~  
complementary to one of the pairs of claws, for securing the support structure to  
25 the beam at that point so that longitudinal movement of the beam relative to the

coupler is inhibited at that point. Those skilled in the art will appreciate that relative longitudinal movement will be permitted between the beam and the support structure at the pair of claws spaced from the securing formation.

5       The spacing between the claws of each pair may be substantially equal to the width of the beam at the position of connection in order to inhibit pivoting or twisting of the beam about its longitudinal axis and to impede relative lateral movement.

10       The assembly may also include a connecting structure for pivotally connecting the end of the wiper arm to the wiper to allow pivotal movement of the wiper arm relative to the wiper in the plane of curvature. It will be appreciated that the connecting structure may form a part of the coupler or of the arm or a combination of both.

15       According to a third aspect of the invention, there is provided a windscreen wiper assembly which includes

a wiper arm;

20       a windscreen wiper having a resiliently flexible elongate beam which is curved in a plane; and

a coupler for coupling an end of the wiper arm to the wiper, the coupler comprising a support structure, with a spacing formation carried by the support structure, and a mounting means for mounting the coupler to the beam at two spaced apart points, with the spacing formation abutting an upper surface of the

beam so that a bottom surface of the support structure is spaced a predetermined distance from the upper surface of the beam.

5 It will be appreciated that the invention has specific application to a low profile wiper and that the coupler is designed to minimise the distance or space between the bottom surface of the support structure and the upper surface of the beam. It will also be appreciated that the distance or space is dependent on the distance between the points of contact and will accordingly be larger when the points of contact are further apart to allow for bending movement of the wiper  
10 between the points of contact.

According to the fourth aspect of the invention, there is provided a windscreen wiper assembly as described above, which significantly reduces the height required between a windscreen and a vehicle bonnet in order to improve  
15 windflow over the vehicle and allow the windscreen wiper assembly and arm to be hidden below the vehicle bonnet.

The height required between the windscreen and the vehicle bonnet may be less than 225 mm.  
20

According to a fifth aspect of the invention, there is provided a coupler for a windscreen wiper assembly, as described above.

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The invention is now described, with reference to the accompanying  
25 drawings, in which;



Figure 1 shows a schematic isometric view of a windscreen wiper assembly, in accordance with the invention with the wiper shown in a straightened condition;

Figure 2 shows a partially exploded view of the assembly of Figure 1;

Figure 3 shows an enlarged view of part of the assembly of Figure 1;

5 Figure 4 shows a sectional end elevation of the assembly of Figure 3 taken along the line IV-IV in Figure 3.

Figure 5 shows a detailed view of part of a windscreen wiper which forms part of the assembly shown in Figure 1;

10 Figure 6 shows a schematic isometric view of a coupler for a windscreen wiper assembly, in accordance with the invention;

Figure 7 shows a bottom view of the coupler of Figure 6;

Figure 8 shows a sectional side elevation of the coupler of Figure 7 taken along the line VIII-VIII in Figure 7.

15 In the drawings, a windscreen wiper assembly, in accordance with the invention, is generally designated by the reference numeral 10.

20 The assembly 10 includes a wiper arm 12, a windscreen wiper 14 and a coupler 16, generally indicated by reference numeral 16, for coupling an end of the wiper arm 12 to the wiper 14. The wiper 14 includes a resiliently flexible elongate beam 18 which is curved in a plane perpendicular to axis Z. A rubber wiping strip 20 is mounted to the beam 18.

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25 The coupler 16 comprises a support structure 23, having an elongate, substantially rectangular, planar base 22. A mounting means in the form of two

pairs of spaced apart claws 24.1 and 24.2 extend from the base 22 of the support structure 23. A pair of fulcrum formations in the form of elongate impressions 26.1 and 26.2 are located transversely to the base 22, each aligned with a corresponding pair of claws 24.1 and 24.2. Each impression 26.1 and 26.2 has a rounded bottom edge 28 as can be seen in Figures 7 and 8.

A pair of support sides 30 extend substantially transversely to the base 22 of the support structure 23, with a pair of aligned openings 32 defined in the support sides 30.

The assembly 10 also includes a connecting structure 34 for pivotally connecting an end 36 of the wiper arm 12 to the wiper 14. The connecting structure 34 includes a substantially planar upper surface 38, with two substantially parallel sides 40 depending downwardly from the surface 38. The sides 40 are spaced a predetermined distance apart so that they fit snugly between the support sides 30 of the coupler 16, so as to prevent lateral movement and rotational movement about the Y axis between the longitudinal axis of the arm 12 and the beam 18. An aperture 42 is defined in each side 40, the apertures 42 being aligned to the openings 32 for receiving a transverse pivot pin 44 for pivotally connecting the coupler 16 to the wiper arm 12.

The assembly also includes a nose piece 46 which covers part of the coupler 16 and connecting structure 34.

---

The beam 18 is provided with a pair of indents 48 (Figure 5), which is complementary to one of the pairs of claws, for securing the coupler 16 to the beam 18 at that point so that longitudinal movement of the beam 18 relative to the coupler 16 is inhibited at that point.

5

In use, the connecting structure 34 is attached to the end 36 of the arm 12. The connecting structure 34 and the coupler 16 are connected to each other by means of the pivot pin 44. The coupler 16 is positioned on the beam 18 so that one of the pairs of claws 24.1 is aligned with the indents 48 on the beam 18, and distal ends 50 of the claws 24 are folded over the beam 18, so that the rounded ends 28 of the fulcrum formations abut an upper surface 52 of the beam 18 as is shown in Figure 4.

10

15

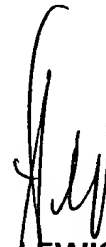
The pair of claws 24.1 which is aligned with the indents 48, secures the beam 18 in position at that point so that longitudinal movement of the wiper 14 relative to the coupler 16 is restrained. The other pair of claws 24.2 are folded over edges of the beam 18 but allows longitudinal movement of the wiper 14 relative to the coupler 16 at that point.

20

In use, movement of the wiper assembly 10 relative to a windscreen causes the wiper 14 to move in the plane of curvature as it straightens and bends to accommodate various curvatures of the windscreen. Movement of the beam 14 in the plane of curvature is allowed by the fulcrum formations.

The applicant believes that the advantages of the wiper assembly 10 as described with reference to the drawings, are that it allows substantially unrestrained movement of the wiper 14 in its plane of curvature and provides a low profile coupler 16 with its associated advantages. The wiper assembly also significantly reduces the height required between the windscreen and the vehicle bonnet, thereby improving wind flow over the vehicle and allow the windscreen wiper assembly and arm to be hidden below the vehicle bonnet.

**DATED THIS 12TH DAY OF OCTOBER 1998**



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ADAMS & ADAMS  
APPLICANT'S PATENT ATTORNEYS**

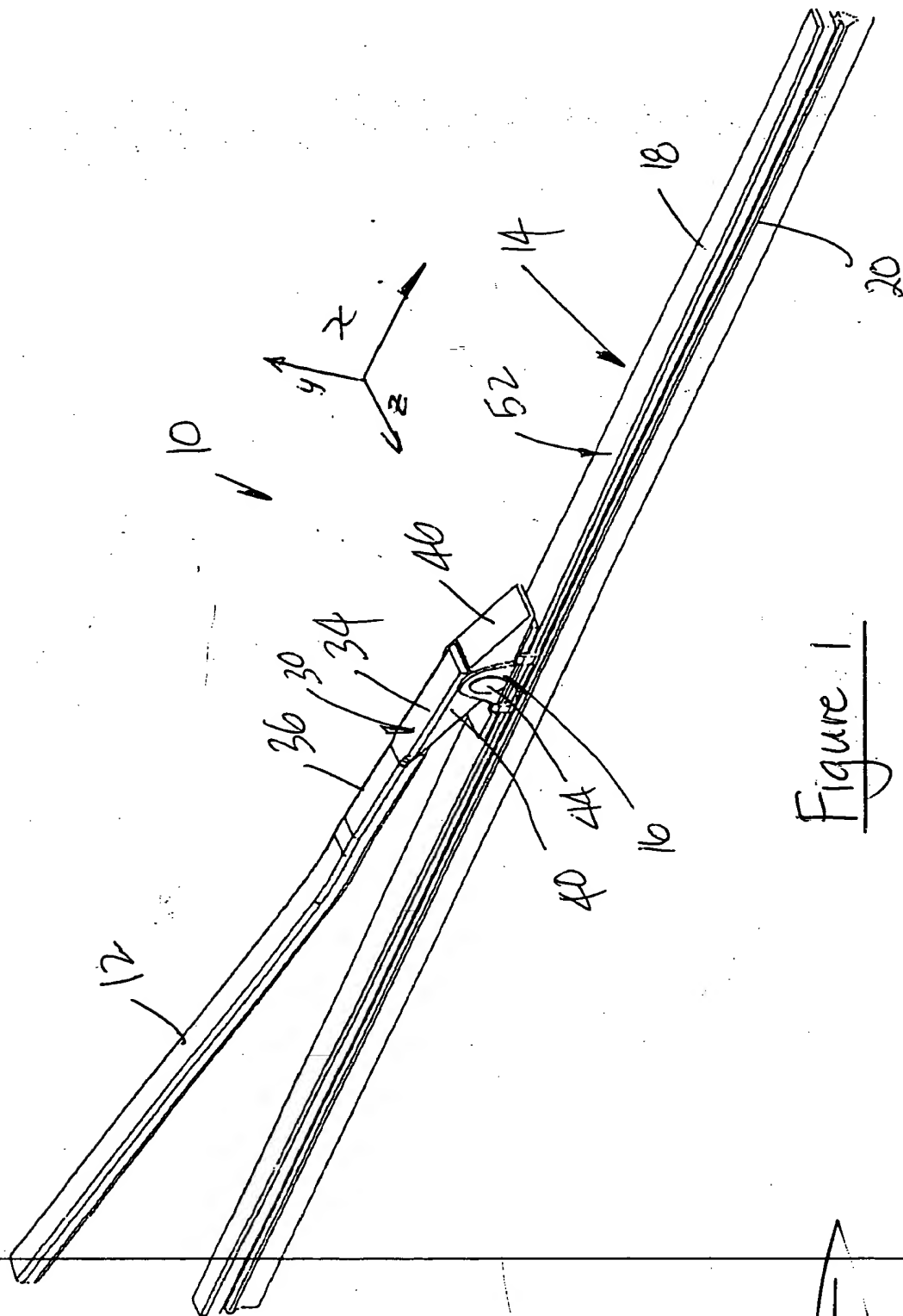


Figure 1

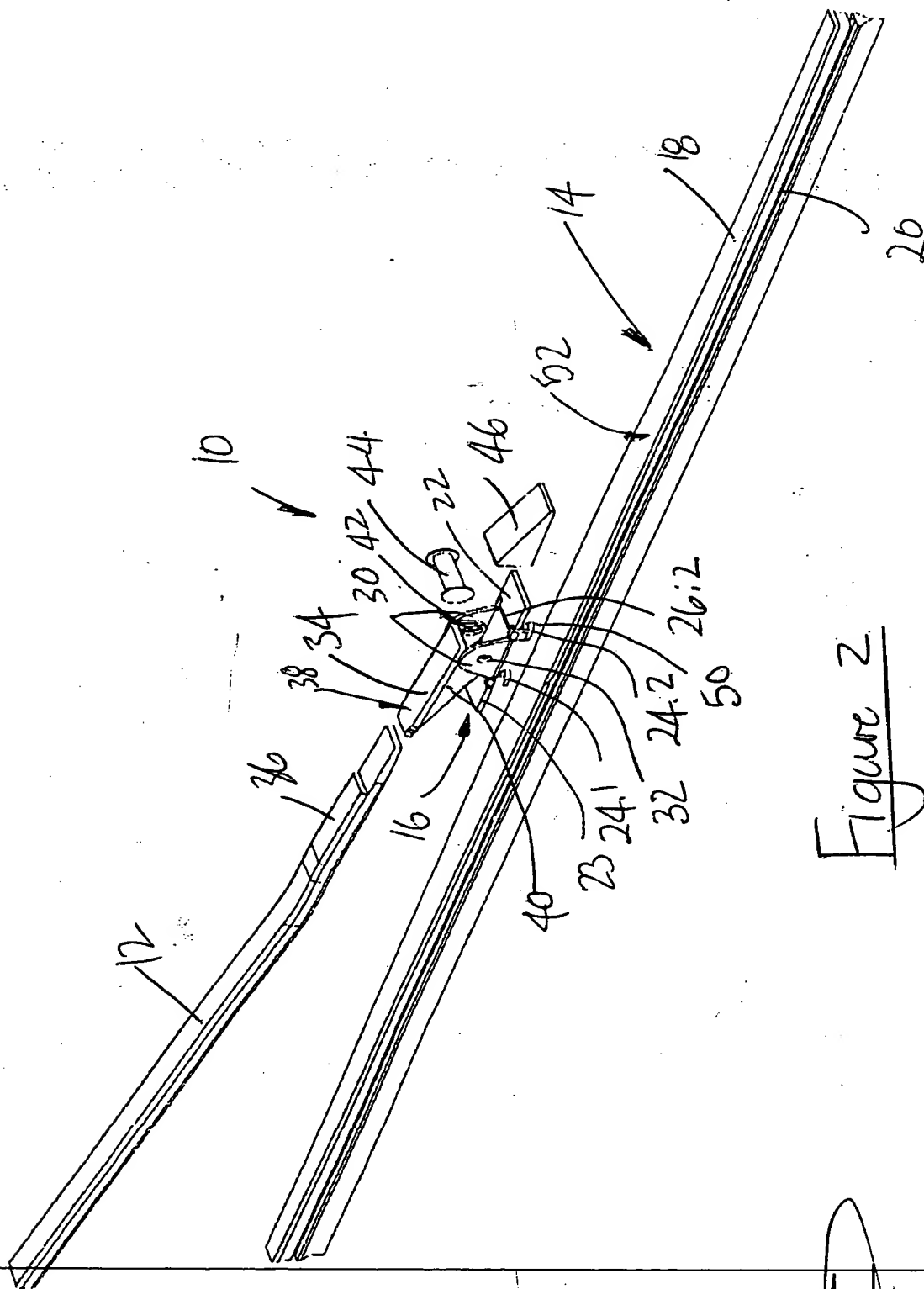


Figure 2

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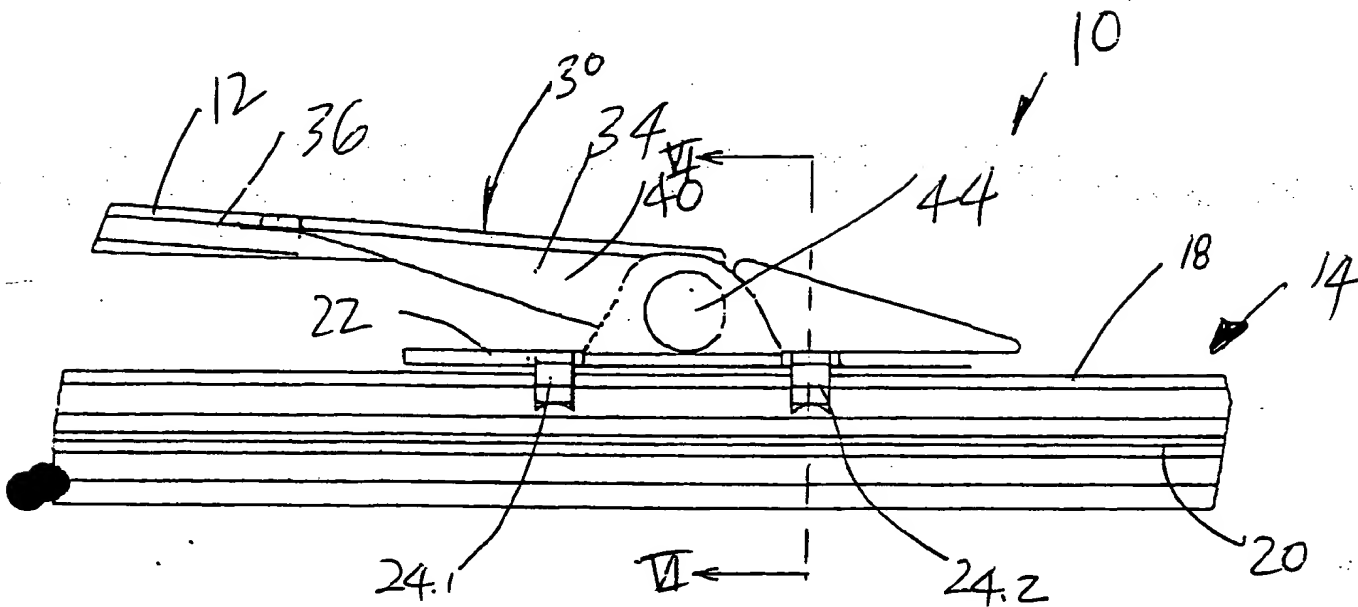


Figure 3

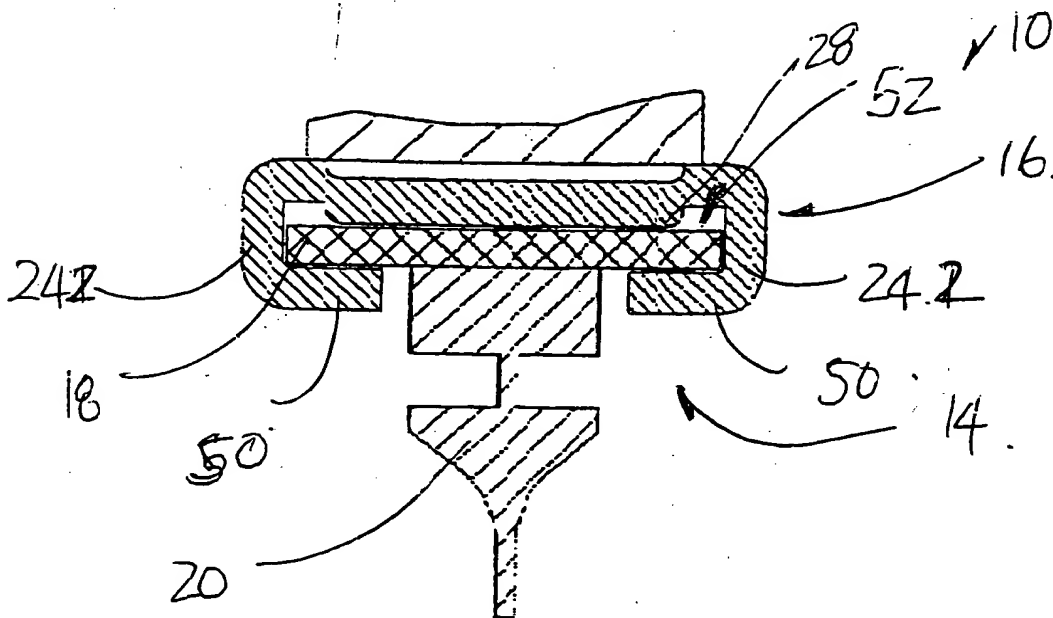


Figure 4

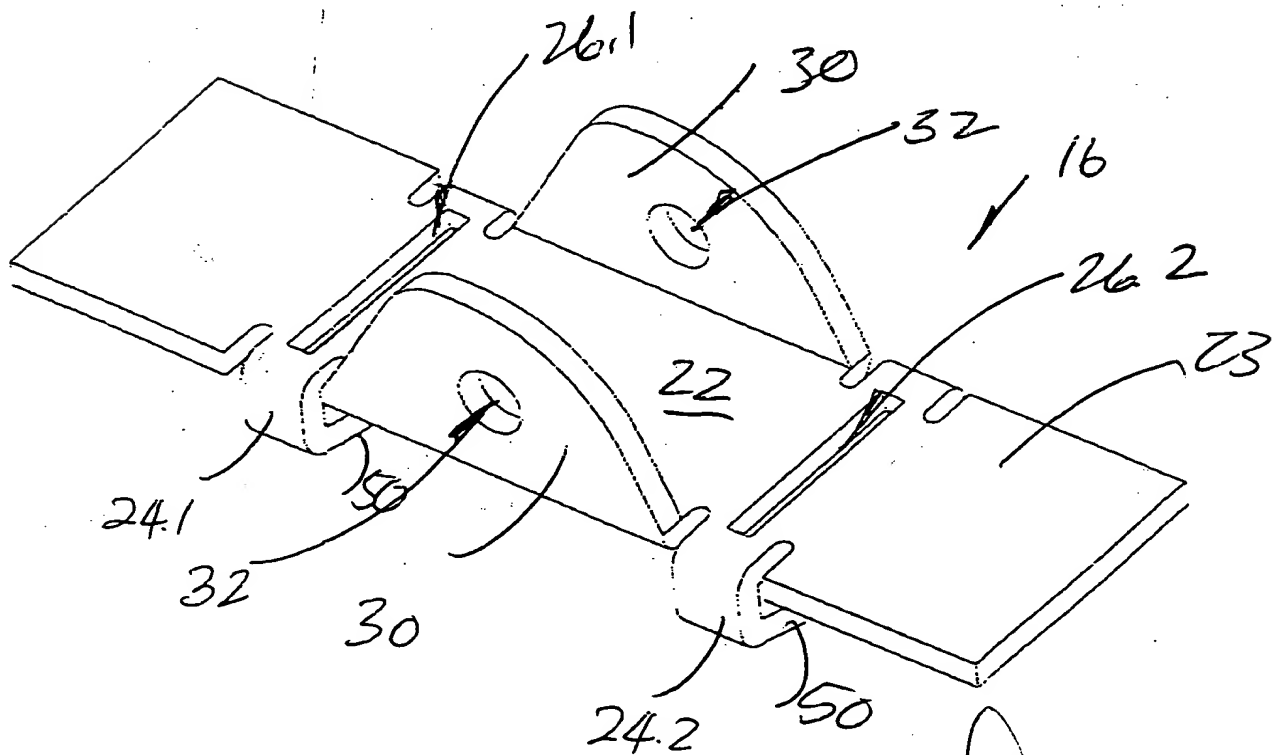
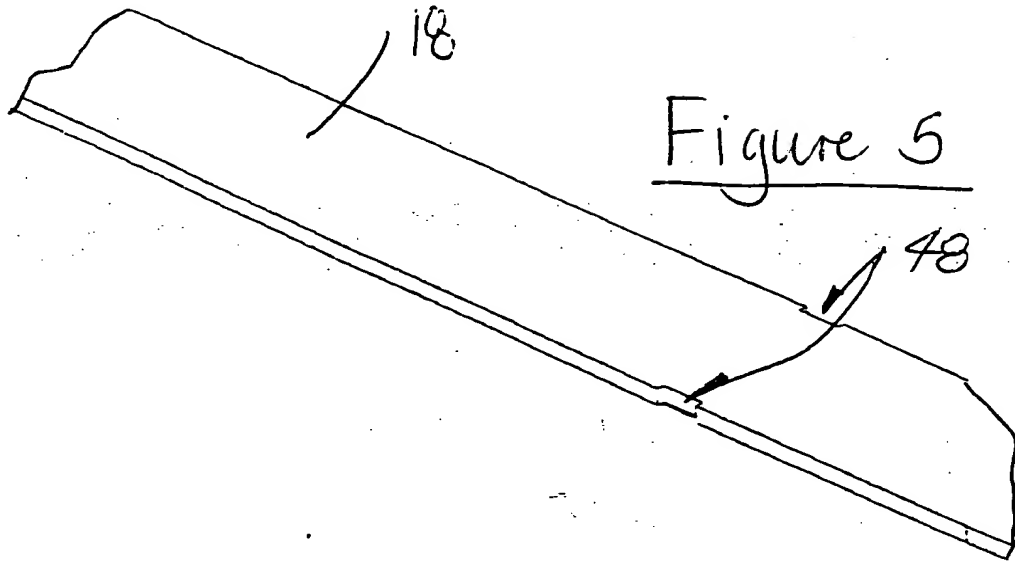




Figure 7

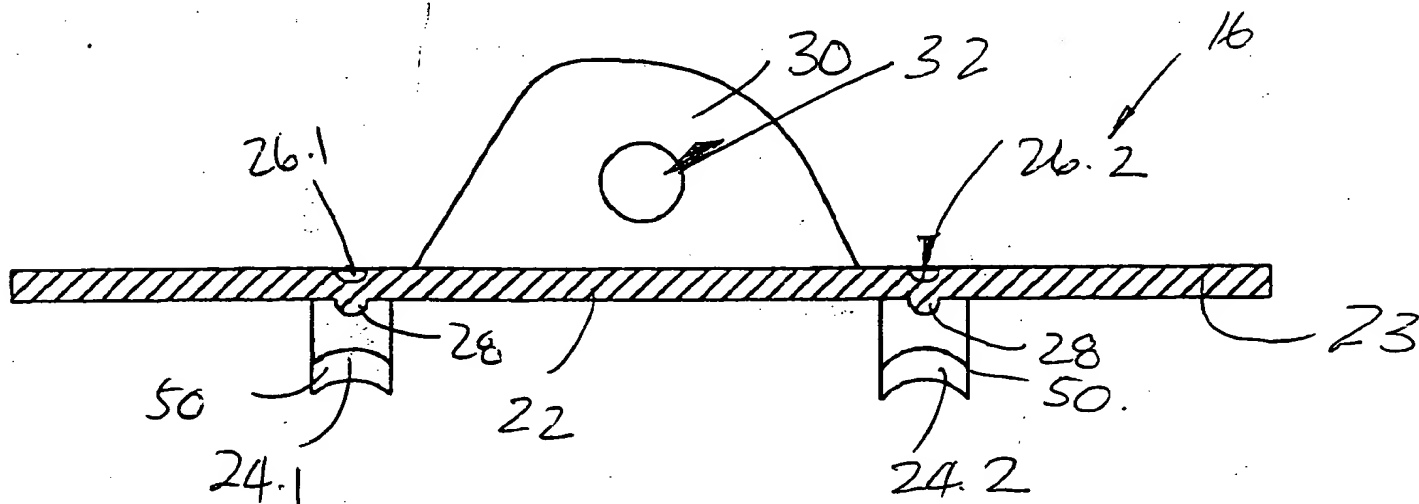
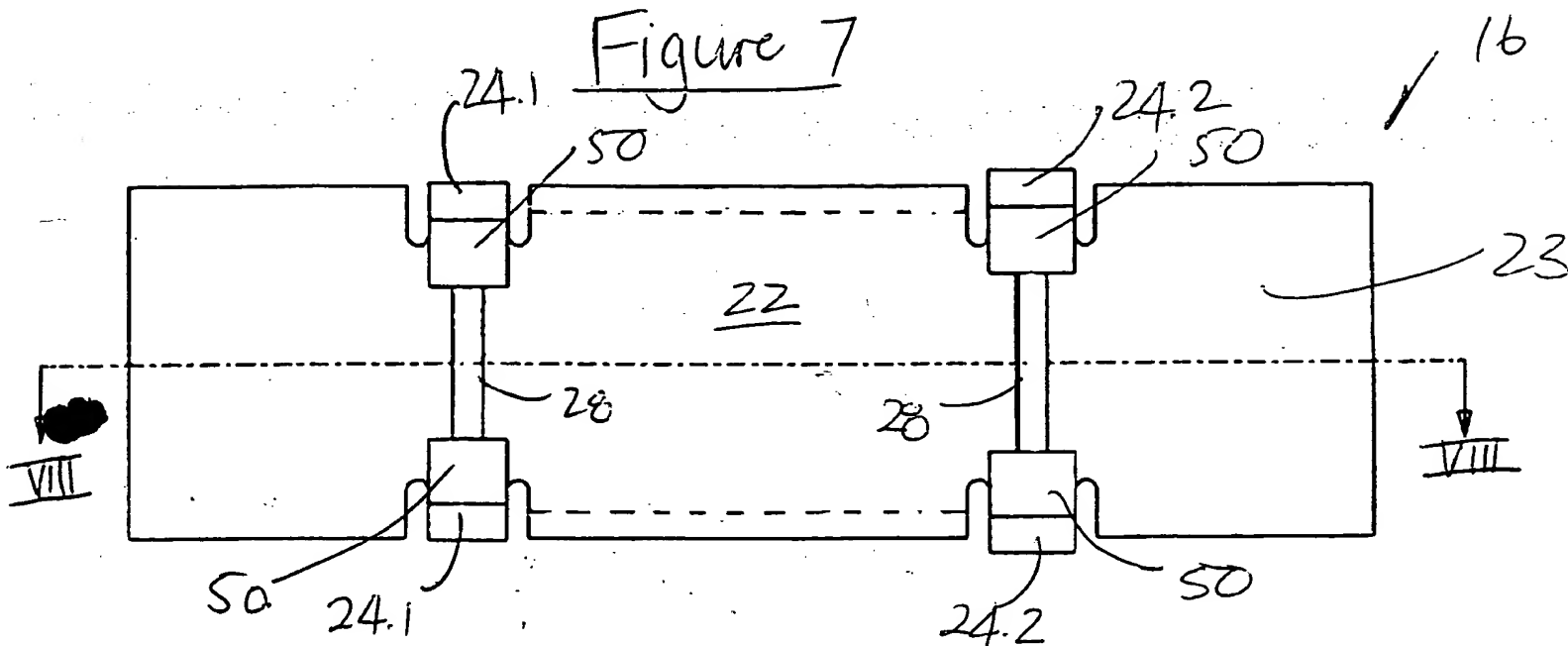


Figure 8.

